

for many months. At Helena, Mont., every month of the last six has failed to bring as much as half its normal precipitation; while at Sioux City, Iowa, Pocatello, Idaho, and Eureka, Calif., no single month yet this year has brought as much as 70 per cent.

SNOWFALL

There was no important snowfall over the Plains or to eastward, except in a very few districts. About the 20th and 21st small amounts fell in eastern North Dakota and to eastward to the vicinity of Lake Superior, while three days later there was a moderate snowfall over much of south-central New York and northeastern Pennsylvania. A considerable portion of eastern Colorado and some parts of adjoining States had rather large amounts for the latter half of May about the 21st.

In the Pacific and Plateau States and practically all of Montana the month's snowfall was unimportant. On the other hand, some portions of the Rocky Mountains

had much new snow, two Colorado stations each measuring more than 50 inches during the month.

SUNSHINE AND RELATIVE HUMIDITY

The Southwest generally, much of the Great Plains, the southern Rocky Mountains and most of the Plateau and portions of the lower Lake region received more than the normal amount of sunshine, while in the central and upper Mississippi Valley much cloudy weather prevailed. Elsewhere about the usual amount of sunshine for May was received. The relative humidity was below the normal generally from the upper Mississippi Valley westward to the Pacific and also throughout the central portions of the Rocky Mountain and Plateau regions, while in the Atlantic States, the Ohio and central Mississippi Valleys and the far Southwest it was generally above the normal, but the plus departures were in no case large.

SEVERE LOCAL STORMS, MAY, 1931

[The table herewith contains such data as have been received concerning severe local storms that occurred during the month. A more complete statement will appear in the Annual Report of the Chief of Bureau]

Place	Date	Time	Width of path, yards ¹	Loss of life	Value of property destroyed	Character of storm	Remarks	Authority
Yakima, Wash.	1	2:30 p. m.				Whirlwind	Several small buildings wrecked	Official, U. S. Weather Bureau.
Rio Grande, Tex.	1	4:30 p. m.	4 mi.		\$2,500	Hail	Roofs damaged; glass broken	Do.
Bishop, Tex.	2	5 p. m.				Hail and wind	Crops and buildings damaged; path 35 miles long.	Do.
Grand Junction, Colo. (near)	3	5-6 p. m.	1-3 mi.			Hail	Considerable damage to pears	Do.
Stanton, Kearney, Finney, Haskell and Gray Counties, Kans.	4	3-5 p. m.	1-6 mi.		1,500,000	Hail and wind	Heavy loss of crops, chiefly wheat; buildings damaged; path 100 miles long.	Do.
Cimarron, Kans. (near)	4	4 p. m.	6		300	Small tornado	Several small buildings damaged; path 3 miles long.	Do.
Blair and Humphrey, Okla., and vicinity.	4	4-5 p. m.	5 mi.		6,700	Hail	Chief damage to crops; path 15 miles long.	Do.
Ness County, Kans.	4	4:45 p. m.	900		25,000	do	Damage chiefly to wheat; path 7 miles long	Do.
Davenport, Fla.	4	6 p. m.	2,640			do	Young citrus fruits considerably damaged	Do.
Electra, Tex.	4	6:30 p. m.				Wind, hail, and rain.	Roofs, chimneys, and merchandise damaged	Do.
Camden, Miss. (near)	4	A. m.			15,000	Tornado and hail	Buildings, fencing, and crops damaged; many large trees uprooted.	Do.
Jefferson and Page Counties, Iowa.	5	9:30-10:30 a. m.			10,000	Wind	Overhead wires and trees considerably damaged.	Do.
Camilla, Ga.	5				7,000	Wind, rain, and hail.	Several roofs damaged; trees blown down	Do.
Fredericksburg, Kerrville, and Comfort, Tex.	6	2:30 p. m.	4 mi.		25,000	Wind and hail	Cars and buildings damaged; considerable injury to crops.	Do.
Canning to Onida, S. Dak.	6	7-8 p. m.	8 mi.		25,000	Hail and wind	Several small buildings wrecked and other property damaged; 3 children injured.	Do.
Madison, Wis. (11 miles east)	6		50		75	Small tornado	Farm property damaged	Do.
Pittsburgh, Pa.	7					Severe thunderstorm.	Streets flooded; electric wires damaged	Do.
Rock Hill, S. C. (near)	7				1,000	Hail	Crops damaged	Do.
Dinwiddie and Prince Georges Counties, Va.	9	6-7 p. m.	¼-4 mi.			Hail and wind	Barns wrecked; fruits ruined in small area	Do.
Parkersburg, W. Va.	9				100,000	Severe thunderstorm.	A fire caused by lightning partially destroyed a mill.	Do.
Windsor, N. C., and vicinity	9					Hail	Tobacco beds and other crops damaged; roofs and windows pierced; poultry killed.	Do.
Bascom, Fla.	10	3 a. m.	1,760			do	Cotton and corn probably total loss	Do.
Albany, N. Y., and vicinity	10	5:15 p. m.	5 mi.		150,000	do	Poultry killed, auto tops and windows broken; roofs and small buildings damaged; fruit trees stripped; telephone company suffered loss.	Do.
Virginia (southeast counties)	10	4 p. m.	5 mi.		10,000	do	Character of damage not reported	Do.
Burlington County, N. J.	10	7:30 p. m.			300,000	do	Severe crop damage; fruit trees stripped; car tops dented.	Do.
Clinton, N. J., and vicinity	10	7:30 p. m.			25,000	do	Crops injured; some property damaged	Do.
Phelps and Junius, N. Y.	10		1,760			do	Fruit trees hurt; windows broken	Do.
Montrose, Pa.	10				5,000	Thunderstorm	Barn and contents destroyed	Do.
Thomas County, Ga. (northwestern)	10		1,760		1,500	Wind, rain, and hail.	Buildings and crops on one plantation damaged.	Do.
Cooperstown, N. Y.	11					Small tornado	A few roofs, trees, and garages damaged.	Do.
Greenbrier County, W. Va. (Falling Springs district).	11					Hail	Roofs and auto tops riddled; windows broken; fruit trees stripped; gardens ruined; poultry killed.	Do.
King William and Gloucester Counties, Va.	13	2-4 p. m.	5-10 mi.		6,000	do	Melon and truck crops seriously damaged	Do.
Newman Grove, Nebr.	17	4-5 p. m.	3 mi.		3,000	Wind and hail	Farm buildings damaged; crops injured; path 10 miles long.	Do.
Dickinson County, Iowa	17	5 p. m.			8,000	Tornado and hail	Character of damage not reported	Do.
Osceola County, Iowa	17	5:30 p. m.			5,500	Tornado	Buildings damaged; livestock injured or killed; path 3 miles long.	Do.
Marietta, S. C.	17				1,000	Hail	Crops damaged	Do.
Tennessee (eastern)	17-18					do	Fruit and other young crops damaged	Do.
Russell County, Va.	18	2 p. m.	2 mi.			do	Considerable damage, character not reported	Do.
Belmont and adjacent counties, Ohio.	18-19				100,000	do	Crops, buildings, and other property severely damaged.	Do.
Sallis, Miss. (4 miles west)	19	A. m.				Violent wind	A barn and residence demolished; 1 person injured; storm covered about an acre.	Do.

¹ "Mi" signifies miles instead of yards.

Severe local storms, May, 1931—Continued

Place	Date	Time	Width of path, yards	Loss of life	Value of property destroyed	Character of storm	Remarks	Authority
Cumberland County, Pa. (western)	19	P. m.			10,000	Severe thunder-storm.	Barn burned; many small buildings damaged.	Official, U. S. Weather Bureau.
Comanche, Tex.	19		1,760		2,500	Hail.	Crops and buildings damaged.	Do.
Terra Haute, Ind. (near)	19				1,500	Wind.	Damage to farm buildings.	Do.
Mobile, Ala.	20					Thundersquall.	Trees blown down; electric service interrupted.	Do.
Clay County, Nebr. (south-western)	21	3:30 a. m.	3 mi.		5,000	Wind.	Character of damage not reported.	Do.
Roxana to Skellytown, Tex.	21	2:30 p. m.			40,000	Tornado.	Crops and other property severely damaged.	Do.
Albany, Tex.	21	6:30 p. m.			15,000	Hail.	Buildings damaged; minor crop injury.	Do.
Cotton County, Okla.	21	7 p. m.	880-1,760		52,000	do.	Chief damage to crops; path 20 miles long.	Do.
Latimer County, Okla. (north-ern)	21	11 p. m.	2,640		3,000	do.	Some damage to crops and other property.	Do.
Virginia (southwestern)	22	2-5 p. m.	2-18 mi.		51,000	Hail and wind.	Heavy crop loss.	Do.
Victor, Dublin, and Carlton, Tex.	22	8 p. m.	9 mi.		40,000	Hail.	Crops destroyed or injured; houses damaged; poultry and lambs killed.	Do.
Anna, Ill. (near)	22					do.	Injury to property slight to severe.	Do.
Caldwell and Burke Counties, N. C.	22				50,000	do.	Crops severely damaged; roofs pierced.	Do.
Stanley County, N. C.	22					do.	Much small grain destroyed; replanting of cotton necessary; gardens total loss.	Do.
Atchison County, Kans.	24	11-12 p. m.	1,300		7,000	Hail and wind.	Injury chiefly to apples, pears, and gardens; path 3 miles long.	Do.
Waukesha and Racine Coun-ties, Wis.	24		10 mi.		5,000	Hail.	Roofs damaged; trees blown down; fruit in-jured.	Do.
Snyder, Tex.	25	4 p. m.			3,000	do.	Crops damaged.	Do.
Lancaster, Ohio.	25	4:30 p. m.				Probably tornado.	Character of damage not reported.	Do.
Crozet, Va., and vicinity.	26	2:30-6:30 p. m.	1,760		40,000	Hail.	Trees, fruits, and gardens severely hurt; path 7 miles long.	Do.
Moorhead (10 miles southeast) to Gary, Minn.	27	4:15 p. m.		2	200,000	Tornado.	Passenger train lifted from rails; several build-ings wrecked; farm machinery damaged; livestock injured or killed; some fields re-quire replanting; 57 persons injured; path 40 miles long.	Do.
Jewell, Rooks, and Osborne Counties, Kans.	27	8-11 p. m.				Hail.	Damage chiefly to wheat.	Do.
Thomas and Grady Counties, Ga.	27				2,000	do.	Crops injured over path several miles long.	Do.
Harlan County, Nebr.	28	2 a. m.	1-2 mi.		75,000	Wind.	20 barns damaged; many windmills wrecked; path 30 miles long.	Do.
Scott County, Iowa.	28	2:30 p. m.	490		2,500	Tornado and wind.	Character of damage not reported; path 2 miles long.	Do.
Des Moines County, Iowa.	28	3 p. m.				Tornado and hail.	No details reported; path 4 miles long.	Do.
Oneida, Ill.	28	4:30 p. m.			5,000	Wind.	Buildings damaged; trees uprooted.	Do.
Galva, Ill. (south).	28					Severe thunder-storm and wind.	Farm buildings blown down or unroofed; trees uprooted.	Do.
Dawson, N. Mex.	29	2:30-3:30 p. m.	2 mi.		1,000	Hail.	Gardens and flowers ruined; too early for crops.	Do.
Field, N. Mex. (near)	29	2-6 p. m.	6 mi.		21,000	do.	Severe damage, character not reported.	Do.
Charlottesville, Va. (near)	30	3:05 p. m.	1,500		9,000	Tornado.	Chief damage to airplane hangar and 3 planes.	Do.
Grove City, Pa.	30	6 p. m.	100		5,000	Thundersquall.	College buildings damaged.	Do.
Bradford County, Pa.	30	P. m.				Thunderstorm and wind.	Damage chiefly to crops.	Do.

RIVERS AND FLOODS

Table of flood stages in May, 1931

By MONTROSE W. HAYES, in charge River and Flood Division

Overflows in the southern part of the Atlantic slope drainage caused miscellaneous damage to the extent of about \$8,000. Timely forecasts were issued and were generally heeded, which reduced the losses to a minimum.

Minor local floods in the Kansas, Canadian, Guadalupe, Pecos, and Colorado Basins caused no damage of consequence.

Stages are very low throughout most of the Mississippi River system, and many stations report the lowest of record for May. Streams are also low in the Pacific slope drainage.

Final reports of the overflows in the Columbia River Basin in March and April indicate the flood damage was about \$10,000 along streams where a flood-warning service is maintained. Along streams where there is no warning service the damage amounted to about \$50,000. Savings effected through the warnings were estimated at \$25,000. At Walla Walla, Wash., there was a severe flood in Mill Creek, destroying or damaging property to the extent of \$500,000.

River and station	Flood stage	Above flood stages—dates		Crest	
		From—	To—	Stage	Date
ATLANTIC SLOPE DRAINAGE					
	<i>Feet</i>			<i>Feet</i>	
Tar: Rocky Mount, N. C.....	9	10	10	9.0	10
Neuse: Smithfield, N. C.....	14	24	26	14.8	25
Cape Fear: Elizabethtown, N. C.....	22	23	26	26.6	24
Pee Dee:					
Cheraw, S. C.....	27	23	24	28.6	23
Mars Bluff Bridge, S. C.....	17	25	29	18.4	27
Saluda: Pelzer, S. C.....	7	21	22	7.4	22
Santee: Rimini, S. C.....	12	9	10	12.0	10
Oconee: Milledgeville, Ga.....	22	24	27	12.7	27
Altamaha: Charlotte, Ga.....	15	5	5	23.5	5
		13	15	15.4	14
MISSISSIPPI SYSTEM					
Missouri Basin.....					
Solomon: Beliot, Kans.....	18	6	6	20.4	6
Republican: Concordia, Kans.....	8	5	5	8.3	5
Arkansas Basin.....					
Canadian: Logan, N. Mex.....	4	2	2	5.6	2
		4	4	5.0	4
		30	30	6.0	30
WEST GULF OF MEXICO DRAINAGE					
Guadalupe: Victoria, Tex.....	16	5	5	16.2	5
Pecos: Pecos, Tex.....	11	1	2	11.6	1
		5	5	11.0	5
GULF OF CALIFORNIA DRAINAGE					
Colorado: Parker, Ariz.....	7	24	31	7.9	25-26